Exhibit 38

UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION,	)	
Plaintiff,	)	
v.	)	**CASE NO. 20 CIV. 10832**
RIPPLE LABS INC., BRADLEY GARLINGHOUSE, AND CHRISTIAN A. LARSEN,	)	
Defendants.	)	

Expert Report of M. Laurentius Marais, PhD
November 12, 2021

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I. Introduction and Background

1. I am an Executive Vice President at Compass Lexecon, a consulting firm that specializes in the rigorous empirical analysis of complex issues in business, industry, and government. I hold a PhD degree and master's degrees in business administration, mathematics, and statistics from Stanford University. I have taught and conducted scholarly research while serving on the faculties of the University of Chicago and Stanford University. I am a fellow of the Royal Statistical Society and a member of the American Statistical Association, the Society for Industrial and Applied Mathematics, and the American Economic Association, among other professional societies. I have extensive experience in applying mathematical and statistical theory and methods and in reviewing and assessing the validity of applied mathematical and statistical studies, inferences, and conclusions.

2. My qualifications and a list of my professional publications are shown in my curriculum vitae, which is appended to this report as Attachment A. A list of cases in which I have testified as an expert at trial or by deposition in the last four years is appended to this report as Attachment B.

3. Compass Lexecon bills for my work in this matter at a rate of $1,040 per hour. My compensation does not depend on the opinions I offer or on the outcome of this proceeding.[1]

4. I understand that the Plaintiff in this matter, the U.S. Securities and Exchange Commission ("SEC"), asserts as follows:[2]

> From at least 2013 through the present, Defendants sold over 14.6 billion units of a digital asset security called "XRP," … without registering their offers and sales of XRP with the SEC …;

and, accordingly, that

[1] In addition to my own time spent on this matter, Compass Lexecon staff have assisted me with the preparation of this report, at their applicable hourly billing rates.

[2] First Amended Complaint ("FAC"), ¶¶ 1 and 9.

> By engaging in the conduct set forth in this Complaint, Defendants engaged in and are currently engaging in the unlawful offer and sale of securities ….

I understand further that Plaintiff has engaged Dr. [redacted] to determine whether "actions by Ripple Labs, Inc. impact XRP prices."[3] Based on what he refers to as the results of his "well-accepted event study methodology," Dr. [redacted] reached the opinion that "XRP prices react to certain news and public statements about Ripple's actions," particularly "news of important milestones in the history of Ripple Labs and for announcements more directly related to XRP."[4]

5. Counsel for Ripple Labs Inc. ("Ripple") asked me to assess, from the perspective of my areas of expertise in applied mathematics and statistics, including the econometric methods used for events studies, whether the analysis, conclusions, and opinions in Dr. [redacted] report are reliable and supported by well-accepted statistical and econometric principles and methods, and whether, based on my expertise, his opinions support the contention that, in economic substance, movements in XRP prices solely or predominantly reflect responses to disclosures about Ripple's actions.

II. Dr. [redacted] Event Study

6. In relevant part, Dr. [redacted] defines his assignment from the Plaintiff as follows:[5]

> I have been retained by the [SEC] … to perform an empirical analysis of XRP's price movements and assess whether actions by Ripple Labs, Inc. impact XRP prices.
>
> I have been asked by the SEC's litigation counsel to test whether news about Ripple Labs and its actions is associated with statistically significant XRP price changes. This association can be

[3] Amended Expert Report of [redacted] Ph.D., October 6, 2021 ("[redacted] Report"), ¶ 10.

[4] [redacted] Report, ¶ 12(a).

[5] [redacted] Report, ¶¶ 10 and 30.

> tested … by evaluating the likelihood that news about Ripple Labs would occur at the same time as a significant XRP price change.

Based on his "empirical analysis of XRP's price movements," Dr. [redacted] opines, in relevant part, as follows:[6]

> I find statistically significant evidence that XRP prices react to news about Ripple's actions.… The results hold for nearly all statistical models I examine at scientifically accepted levels of statistical significance.… Taken together, this evidence indicates that XRP prices react to the news of actions by Ripple Labs.

7. This language invites a reader of the [redacted] Report to conclude that Dr. [redacted] has identified statistical "evidence" showing that XRP price movements are driven largely—and causally—by actions taken by Ripple. As I explain below, Dr. [redacted] event study is not designed to investigate this proposition and does not, in fact, support such a conclusion. Properly interpreted, Dr. [redacted] event study rebuts rather than supports the conclusion that the price of XRP is primarily a function of disclosures about Ripple's actions.

8. Dr. [redacted] summarizes the statistical support for his opinion as follows:[7]

> In Figure 1, I present a summary table that illustrates my findings. Across 20 different regression model specifications, which in varying degrees account for the price movements of digital tokens like Bitcoin ("BTC"), Ether ("ETH"), and other variables, I indicate the cases in which the relationship between news and XRP prices is statistically significant.

[6] [redacted] Report, ¶ 12(a).

[7] [redacted] Report, ¶ 12(a).

FIGURE 1: XRP PRICES REACT TO DIFFERENT TYPES OF RIPPLE NEWS

Model Number	Milestones	Trading Platform Listings	Customers & Product Developments	Ripple Commercialization Initiatives	Select Categories
1	✓	✓	✓	✓	✓
2	✓	✓	✓		✓
3	✓	✓	✓	✓	✓
4	✓	✓	✓		✓
5	✓	✓	✓	✓	✓
6	✓	✓	✓		✓
7	✓	✓	✓	✓	✓
8	✓	✓	✓		✓
9	✓	✓	✓	✓	✓
10	✓	✓	✓		✓
11	✓	✓	✓	✓	✓
12	✓	✓	✓	✓	✓
13	✓	✓	✓	✓	✓
14	✓	✓	✓	✓	✓
15	✓	✓	✓	✓	✓
16	✓	✓	✓		✓
17	✓	✓	✓	✓	✓
18	✓	✓	✓		✓
19	✓	✓	✓	✓	✓
20	✓	✓	✓	✓	✓

Notes:
✓ Indicates significance at the 5% level.
Indicates not significant at the 5% level.

Select Categories is defined as the combination of Corporate Milestones, Trading Platform listings, Customer & Product Announcements, Ripple Commercialization Initiatives, and Acquisitions & Investments.

9. In the following subsections, I provide a brief explanation of the methodology by which Dr. [redacted] created the table above, on which Dr. [redacted] bases the opinion quoted in ¶ 6 above.

A. Nature of the Data Used for the [redacted] Event Study

10. The [redacted] event study involves data on XRP market prices on approximately 2,740 consecutive trading days[8, 9] during the period February 4, 2014 – August 5, 2021. For each trading day in this range, Dr. [redacted] obtained the

[8] Some of Dr. [redacted] 20 predictive models are limited to subperiods of the full [redacted] analysis period due to data limitations.

[9] Dr. [redacted] further limits the time period for his analyses based on occurrence of specific Ripple news events. More specifically, he drops days before the first news day and days after the last news day of each [redacted] news events category. Dr. [redacted] provides no justification for his decision to exclude those days, and none is self-evident. I did not apply Dr. [redacted] exclusions in my own analyses reported here.

reported "closing" price of XRP in U.S. dollars. For all but the first trading day, he then calculated the corresponding daily percentage return on a unit of XRP for that day. For example, if XRP closed at $0.90 on day 0 and $1.00 on day 1, the day 1 return is 11.1% (= $1.00/$0.90 – 1).[10]

11. By analogy to well-established methods and accepted academic research, as applied to the study of price movements for equity securities traded on public exchanges, it is reasonable to hypothesize that these daily XRP returns are driven in part by noise trading but also in part by information-based trading in response to both XRP-specific information and more general, market-influencing information that affects prices of cryptocurrencies and other assets more broadly. The event study methodology applied to price movements of equity security returns typically attempts to partition such returns data into one component that reflects the impact of market-wide information, from which the "normal" or expected return on the same day can be estimated, and a second, residual, component that remains after removing the market-wide components and pertains specifically to the individual security of interest: the so-called "abnormal return."

12. Dr. [redacted] attempts to apply an analogous approach to his event study in this matter. He posits 20 distinct statistical regression models[11] for removing from each day's total XRP return the component due to market-wide effects, leaving an XRP-specific "abnormal return" (*i.e.*, residual percentage change) for each trading day. Each of his 20 alternative statistical models produces a series of daily abnormal XRP returns for each day in his analysis period.

13. For each of his 20 models, Dr. [redacted] also posits four distinct approaches for identifying what he labels "significantly positive" return days (hereinafter "Unusual" trading days): a "Parametric Approach" and a "Nonparametric

[10] More precisely, Dr. [redacted] actually uses an essentially equivalent formula that defines returns in terms of the natural logarithms of price ratios.

[11] [redacted] Report, ¶¶ 39–42.

Approach," each implemented on either a "one-sided " or a "two-sided" basis, for a total of four "approaches."[12] Thus, Dr. [redacted] posits a total of 80 distinct methods (= 20 models × 4 approaches) for identifying a particular daily XRP return as Unusual or, alternatively, Regular (shorthand for *not* Unusual).[13] In sum, Dr. [redacted] employs 80 alternative methods to convert the single series of XRP daily closing prices to 80 alternative corresponding series of binary classifications of each XRP trading day as "Unusual" or "Regular."[14]

14. The stated objective of Dr. [redacted] event study is to detect any association between news events concerning Ripple's actions and Unusual XRP pricing. Thus, the second major data input of his event study consists of labeling each XRP trading day as either involving or not involving a Ripple news event. For this purpose, Dr. [redacted] subjectively creates five main categories of Ripple news events, which he labelled: Key Milestones, Digital Asset Trading Platform Listings, Customer and Product Announcements, Commercialization Initiatives, and an aggregate category of "Select" events that includes all events in the first four categories.[15] Dr. [redacted] then determines, based on his own subjective judgments, without apparent reliance on any generally accepted statistical or economic methodology, on which of the trading days in his analysis there was a significant, new Ripple news event. Each category thus yields a corresponding series of binary

[12] [redacted] Report, ¶¶ 62–63.

[13] I use the descriptive terms "Unusual" and "Regular" in my discussion of Dr. [redacted] event study rather than his own term ("significantly positive") because "statistical significance" (at a specified level, typically 5%) is an unambiguously defined term of art, while Dr. [redacted] procedure involves many more steps and choices than a straightforward textbook determination of statistical significance.

[14] For determining whether a trading day is "Unusual," Dr. [redacted] focuses on the three-day period starting on that day. He flags a trading day as "Unusual" if any of the one-day, two-day, or three-day returns is statistically significantly positive and none of the three is statistically significantly negative ([redacted] Report, ¶ 63).

[15] [redacted] Report at 3, Figure 1. "Select" news events also include one additional category of news: Acquisitions & Investments.

classifications for each XRP trading day as "Yes" or "No," reflecting the occurrence (or not) of what Dr. [redacted] determined to be a Ripple news event.

15. In sum, therefore, Dr. [redacted] posits a total of 400 alternative configurations (= 80 methods × 5 categories of news events) of methods and data for analyzing XRP pricing in relation to Ripple news events.

B. Dr. [redacted] Analysis of and Inference from His Event Study

16. In this subsection, I use one of Dr. [redacted] 400 configurations of methods and data as an illustrative example to explain his basis for the conclusion he draws from his event study, as well as my assessment of the validity and scope of his conclusion. Specifically, I use his Model 5 in conjunction with his "one-sided" "Parametric Approach" in relation to his "Key Milestones" category of Ripple news events.

17. Table 1 below shows the disposition of the 2,007 trading days in this variant of the [redacted] event study.[16]

Table 1: [redacted] Analysis of Ripple Key Milestone News Events in Relation to Unusual XRP Return Days as Identified by Dr. [redacted] Model 5 and One-Sided Parametric Approach

		Daily XRP Return		
		Unusual	Regular	*All*
News Event?	Yes	4	1	5
	No	179	1,823	2,002
	All	183	1,824	2,007

Source: [redacted] backup.

The table shows that Dr. [redacted] methods classified a total of 183 (9.1%) of the 2,007 trading days as Unusual, and a total of five trading days (top row, right-hand column) as containing a Key Milestone news event. Of these five news days, *four* days with Key Milestone events (80% = 4/5) coincided with Unusual trading days.

[16] Here too (*see* fn. 9 above), I do not adopt Dr. [redacted] implicit assumption that days before the first Key Milestone news event (May 18, 2015) and days after the last Key Milestone news event (December 20, 2019) are irrelevant to his analysis.

18. Dr. [redacted] analysis of this observed outcome consists essentially of recognizing that the Ripple news days tend to coincide with Unusual XRP trading days. Put differently, it is extremely unlikely that a sample of only five trading days chosen *at random* from among 2,007 trading days (including only 183 Unusual trading days) will be found to contain as many as *four* Unusual days. Accordingly, Dr. [redacted] concludes that this observed coincidence is a "statistically significant" departure from complete independence between Ripple news days and Unusual XRP trading days, indicating that there existed a nonzero correlation between Unusual XRP returns and the Key Milestones category of Ripple news events.

19. One striking feature of Dr. [redacted] analysis of the tallies shown in Table 1 above—not highlighted by Dr. [redacted] is that it offers no account of what factors or events caused the remaining 179 (= 183 – 4) Unusual trading days to have Unusual XRP returns. Put differently, Dr. [redacted] analysis advances an explanation for four out of 183 Unusual XRP returns but is silent about any causation of the great majority[17] of the Unusual XRP returns identified by that same analysis.

20. Nothing in Dr. [redacted] analysis rules out that the unaccounted-for factors driving the 179 *non*-coincident Unusual returns—rather than the Ripple news event—may also have operated during the four *coincident* trading days, and may thus have driven the Unusual returns on those days as well, in whole or in part. In sum, the association between Dr. [redacted] subjectively selected days with Ripple news events and Unusual trading days, as a matter of fundamental statistical principles and common sense alike, does not per se establish that the Ripple Key Milestones news *caused* the abnormal XRP returns on the four

[17] There are almost 45 times as many *non*-coincident Unusual returns as *coincident* Unusual returns.

coincident days. Thus, Dr. [redacted] overreaches in his apparent *causal* claim that "XRP prices *react to* the news of actions by Ripple Labs."[18]

21. Simple tallies of news event occurrences with and without coincidences with Unusual XRP returns, lacking any consideration of the magnitudes of these returns, provide no indication of the economic magnitude of the disparity between the four coincident and 179 *non*-coincident trading days. To illustrate this point, if $1.00 were invested and reinvested for the four coincident days found in Dr. [redacted] study (plus the two days following each coincident day)[19], the proceeds would be an accumulated total value of $1.99.[20] In striking contrast, the same dollar invested and reinvested for the 179 *non*-coincident Unusual trading days (plus the two days following each non-coincident day) would have compounded to a total value of $4,198,673, more than 2.1 *million* times $1.99.[21] This overwhelming disparity suggests that, from the perspective of a speculative XRP investor, the 179 Unusual return days *without* Ripple news were of considerably greater consequence than the four Unusual return days *with* Ripple news.

22. In sum, Ripple news events are associated with a relative handful of the Unusual XRP returns in Dr. [redacted] analysis, while the great majority of Unusual days and the overwhelming preponderance of compounded investment returns associated with Unusual trading days occurred on days that did *not* coincide with Ripple news events identified by Dr. [redacted]

[18] [redacted] Report, ¶ 12(a) (emphasis added).

[19] I use three-day windows for this analysis to parallel Dr. [redacted] reliance on three-day windows for his identification of Unusual trading (*see* fn. 14 above).

[20] For example, $1.99 represents the compounded final hypothetical proceeds, at the end of the final day among the four Unusual trading days (plus the two days following each) that coincided with Ripple news events in Dr. [redacted] Key Milestones category, from purchasing $1.00 in XRP at the last closing price before the first of these Unusual days, selling at the closing price two days later, and then reinvesting the proceeds in the same way for each Unusual day in succession.

[21] *See* Table 3 and ¶ 28 below.

III. The News Events Dr. [redacted] Identifies Fail To Account for the Great Majority of the "Unusual" XRP Trading Days He Identifies

23. The Model 5 example from § II.B above represents just one of the 400 configurations of the [redacted] event study (*see* ¶¶ 12–15 above). Table 2 below summarizes those 100 among these 400 configurations that use the first of Dr. [redacted] four distinct analytical approaches (described in ¶ 13 above). The results of the other three [redacted] approaches are displayed in the same format in Attachment D. The Model 5 example above appears in row 5, under "Key Milestones."

Table 2

[redacted] Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days
"Unusual" Trading Days Identified by Dr. [redacted]s "One-Sided Parametric Approach"

[redacted] Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			[redacted] "Select" Categories (i.e., All News Dates) (Max N=105)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	2,740	235	6	229	2	5	230	6	12	223	61	3	232	4	24	211	81
2	2,723	204	5	199	3	4	200	7	13	191	60	2	202	5	24	180	81
3	2,740	238	5	233	3	5	233	6	12	226	61	3	235	4	25	213	80
4	2,723	212	4	208	4	4	208	7	11	201	62	2	210	5	21	191	84
5	2,007	183	4	179	1	5	178	6	12	171	48	3	180	4	24	159	66
6	1,990	146	3	143	2	4	142	7	12	134	48	2	144	5	21	125	69
7	2,007	161	4	157	1	4	157	7	12	149	48	3	158	4	22	139	68
8	1,990	146	3	143	2	4	142	7	12	134	48	2	144	5	20	126	70
9	2,740	244	5	239	3	4	240	7	13	231	60	3	241	4	25	219	80
10	2,723	221	4	217	4	4	217	7	12	209	61	2	219	5	22	199	83
11	2,739	237	6	231	2	5	232	6	13	224	60	3	234	4	25	212	80
12	2,722	213	4	209	4	5	208	6	14	199	59	3	210	4	26	187	79
13	2,739	232	5	227	3	5	227	6	12	220	61	3	229	4	25	207	80
14	2,722	220	4	216	4	5	215	6	11	209	62	3	217	4	24	196	81
15	2,006	176	4	172	1	4	172	7	12	164	48	3	173	4	23	153	67
16	1,989	162	3	159	2	5	157	6	12	150	48	2	160	5	22	140	68
17	2,006	167	4	163	1	4	163	7	10	157	50	3	164	4	21	146	69
18	1,989	158	3	155	2	5	153	6	11	147	49	2	156	5	21	137	69
19	2,739	233	5	228	3	5	228	6	12	221	61	3	230	4	25	208	80
20	2,722	227	5	222	3	5	222	6	13	214	60	3	224	4	25	202	80

Source: [redacted] backup.
Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 40.3, 5th percentile is 6.6, 95th percentile is 79.2.

24. The 20 rows of the table correspond to Dr. [redacted] 20 Models (described in ¶ 12 above). The columns of the table are grouped into five categories that correspond to Dr. [redacted] five categories of Ripple news events, from Key Milestones on the left to [redacted] "Select" on the right (¶ 14 above). Within each of these groupings, there are three columns, representing counts of Unusual trading days that *coincide* with Ripple news days in the indicated category, Unusual trading days that do *not* coincide with Ripple news days in the indicated category, and Ripple news days that coincide with Regular (that is, *not* Unusual) trading days, respectively.

25. The ratio of "almost 45 times as many *non*-coincident Unusual returns as *coincident* Unusual returns" from fn. 17 above is that of 179 to 4 in the first and second columns of row 5 under the header Key Milestones. This ratio reflects the disparity between Unusual returns without an apparent association with Ripple news identified by Dr. [redacted] and those that *do* coincide with such news. It can be calculated for each of the 100 [redacted] analysis configurations shown in the table. The median of these 100 ratios is 40.3, and 90% of them fall in the range from 6.6 to 79.1. This shows that the predominance of non-coincident Unusual returns over coincident Unusual returns that is quantified by the ratio of "almost 45 times" in the Model 5 example in § II.B above is no aberrant outlier limited to that particular example; rather, this predominance is pervasive throughout the many configurations of Dr. [redacted] event study (because "almost 45 times" is well within the range "from 6.6 to 78.4").

26. In sum, Ripple news events are associated with a relative handful of the Unusual XRP returns in Dr. [redacted] analysis, while the great majority of Unusual returns occurred on days that did *not* coincide with Ripple news events identified by Dr. [redacted]

IV. The Overwhelming Preponderance of the Cumulative XRP Returns Associated with the "Unusual" Trading Days Dr. [redacted] Identifies Is Not Associated with the Ripple News Event Days He Identifies

27. Table 3 below parallels Table 2 above but summarizes cumulative, compounded Unusual XRP returns instead of the simple tallies of Unusual trading days discussed in § III above. Table 3 again summarizes those 100 [redacted] event study configurations that use the first of Dr. [redacted] four distinct analytical approaches (described in ¶ 13 above). The results of the other three [redacted] approaches are displayed in the same format in Attachment E.

Table 3

[redacted] Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News

Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [redacted]s "One-Sided Parametric Approach"

	[redacted] Ripple News Event Category:		Key Milestones			Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			[redacted] "Select" Categories (i.e., All News Dates)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in [redacted] Analysis Period	"Unusual" Trading Days in [redacted] Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	$34.26	$4,404,943,559	$2.05	$1,814,870,743	$1.08	$2.45	$1,939,936,630	$0.51	$91.55	$29,032,638	$0.51	$3.80	$1,158,169,642	$1.06	$586.66	$2,939,472	$0.33
2	$26.06	$274,588,059	$1.52	$152,500,970	$1.46	$2.18	$126,121,683	$0.57	$107.28	$1,560,391	$0.44	$2.49	$71,973,458	$1.62	$510.31	$212,832	$0.38
3	$34.26	$1,623,199,077	$2.04	$687,687,307	$1.09	$2.45	$714,856,684	$0.51	$108.63	$8,762,771	$0.43	$3.80	$426,779,564	$1.06	$713.15	$885,706	$0.27
4	$26.06	$82,554,034	$1.52	$47,145,813	$1.47	$2.18	$37,918,086	$0.57	$85.93	$590,142	$0.54	$2.49	$21,638,593	$1.62	$372.69	$90,291	$0.52
5	$92.55	$8,352,186	$1.99	$4,198,673	$1.03	$2.45	$3,678,302	$0.51	$75.49	$64,976	$0.48	$3.80	$2,195,998	$1.06	$482.20	$7,776	$0.29
6	$70.39	$259,267	$1.48	$175,689	$1.39	$2.18	$119,084	$0.57	$75.49	$2,735	$0.48	$2.49	$67,958	$1.62	$318.56	$495	$0.44
7	$92.55	$908,467	$1.99	$456,689	$1.03	$2.18	$450,661	$0.57	$64.68	$8,595	$0.56	$3.80	$238,859	$1.06	$358.01	$1,204	$0.39
8	$70.39	$124,990	$1.48	$84,698	$1.39	$2.18	$57,409	$0.57	$64.68	$1,604	$0.56	$2.49	$32,762	$1.62	$266.41	$302	$0.53
9	$34.26	$311,247,562	$2.04	$131,863,677	$1.09	$2.18	$154,399,767	$0.57	$117.43	$1,849,615	$0.40	$3.80	$81,834,755	$1.06	$684.41	$210,117	$0.28
10	$26.06	$35,805,980	$1.52	$20,448,450	$1.47	$2.18	$16,446,128	$0.57	$92.90	$342,822	$0.50	$2.49	$9,385,260	$1.62	$402.89	$52,335	$0.48
11	$34.91	$4,993,983,115	$2.05	$2,057,559,586	$1.08	$2.45	$2,199,349,582	$0.51	$125.88	$31,311,651	$0.37	$3.80	$1,313,042,848	$1.06	$806.64	$3,170,216	$0.24
12	$26.55	$175,818,959	$1.43	$107,244,603	$1.55	$2.45	$71,693,590	$0.51	$100.03	$1,059,140	$0.47	$3.80	$46,227,194	$1.06	$501.64	$141,294	$0.39
13	$34.91	$1,518,622,995	$2.04	$643,382,425	$1.09	$2.45	$668,801,390	$0.51	$118.16	$8,391,536	$0.40	$3.80	$399,283,901	$1.06	$775.67	$848,183	$0.25
14	$26.55	$104,448,189	$1.52	$59,649,354	$1.47	$2.45	$42,590,774	$0.51	$85.93	$602,651	$0.54	$3.80	$27,462,037	$1.06	$542.89	$74,866	$0.36
15	$87.93	$5,910,838	$1.99	$2,971,398	$1.03	$2.05	$2,828,966	$0.61	$70.23	$69,101	$0.52	$3.80	$1,554,107	$1.06	$375.27	$8,987	$0.37
16	$66.87	$603,304	$1.48	$408,821	$1.39	$2.45	$246,009	$0.51	$75.49	$4,804	$0.48	$2.49	$158,135	$1.62	$358.83	$775	$0.39
17	$87.93	$939,991	$1.99	$472,537	$1.03	$2.18	$466,299	$0.57	$40.79	$13,752	$0.89	$3.80	$247,147	$1.06	$230.69	$1,891	$0.61
18	$66.87	$164,742	$1.48	$111,636	$1.39	$2.45	$67,177	$0.51	$60.29	$2,331	$0.60	$2.49	$43,181	$1.62	$285.81	$363	$0.49
19	$34.91	$327,751,160	$2.04	$138,855,619	$1.09	$2.45	$144,341,573	$0.51	$92.90	$1,917,968	$0.50	$3.80	$86,173,963	$1.06	$609.85	$193,431	$0.32
20	$26.55	$30,566,988	$1.52	$17,376,707	$1.46	$2.45	$12,464,282	$0.51	$93.32	$277,056	$0.50	$3.80	$8,036,824	$1.06	$454.49	$37,665	$0.43

Source [redacted] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 109,684, 5th percentile is 5.8, 95th percentile is 340,794,133.

28. The structure of this table parallels that of Table 2 as explained in ¶¶ 23–24 above. The ratio of "more than 2.1 *million* times" from ¶ 21 above is that of $4,198,673 to $1.99 in the first and second columns of row 5 under the header Key Milestones. This ratio again reflects the disparity between Unusual returns without an apparent association with Ripple news events identified by Dr. [redacted] and those that *do* coincide with such news events. It can again be calculated for each of the 100 [redacted] analysis configurations shown in the table. The median of these 100 values is 109,684, and 90% of them fall in the range from 5.8 to 340.8 million. Thus, the predominance of *non*-coincident Unusual returns over *coincident* Unusual returns from the Model 5 example in § II.B above is again no aberrant outlier; rather, this predominance is pervasive throughout the many configurations of Dr. [redacted] event study (because "more than 2.1 million times" is well within the range "from 8.0 to 336.8 million").

29. In sum, Ripple news events are associated with a relative handful of the Unusual XRP returns in Dr. [redacted] analysis, while the overwhelming preponderance of compounded investment returns associated with Unusual trading days occurred on days that did *not* coincide with Ripple news events identified by Dr. [redacted]

V. Conclusion

30. In sum, it would be wrong to interpret Dr. [redacted] event study as establishing that XRP price movements are essentially a function of Ripple's actions. Instead, the [redacted] event study cannot prove a causal relationship between Ripple's actions and XRP price movements. And, even if it could do so, the [redacted] event study documents at best that any dependence of XRP price movements on Ripple-related news accounts for no more than a modest, far from preponderant portion of XRP's Unusual price movements since 2014.

31. I hold each opinion expressed in this report to a reasonable degree of economic, mathematical, and statistical certainty. My opinions are based on information, data, and analyses of types typically and reasonably relied upon by

experts in economics, statistics, and applied mathematics. I may perform further work, and I may supplement this report in light of additional information or analysis. In particular, I understand that I may be asked to assess and respond to any opinions or exhibits offered by the parties at or before a trial in this matter.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 12, 2021.

M. Laurentius Marais

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Attachment A:

Curriculum Vitae of M. Laurentius Marais

November 2021

M. LAURENTIUS MARAIS

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332 S Michigan Ave, Ste 1300
Chicago, IL 60604

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EDUCATION:

PhD	Stanford University (Business Administration, Mathematics), 1985
MS	Stanford University (Statistics), 1983
MS	Stanford University (Mathematics), 1976
BSc	Stellenbosch University (Mathematics, Applied Mathematics, Computer Science), 1973

EMPLOYMENT:

2019	present	Compass Lexecon, Executive Vice President
1993	2019	William E. Wecker Associates, Vice President and Principal Consultant
1994	1998	Stanford University School of Law, Consulting Professor
1992	1993	William E. Wecker Associates, Senior Consultant
1982	1991	University of Chicago Graduate School of Business, Instructor, Assistant Professor, and Associate Professor

ACTIVITIES:

Referee for: *Journal of Business and Economic Statistics*
Journal of Financial Research
Journal of Accounting Research
Journal of Accounting and Economics
The Accounting Review
Contemporary Accounting Research
Journal of Money, Credit and Banking

Editorial Board, *Journal of Accounting Research*, 1987-1992

Member of: American Statistical Association
Royal Statistical Society
Mathematical Association of America
Society for Industrial and Applied Mathematics
American Accounting Association
American Economic Association

PUBLICATIONS and WORKING PAPERS:

The experimental design of classification models: an application of recursive partitioning and bootstrapping to commercial bank loan classifications, (with James M. Patell and Mark A. Wolfson), *Journal of Accounting Research*, 1984.

An application of the bootstrap method to the distribution of squared, standardized market model prediction errors, *Journal of Accounting Research*, 1984.

An analysis of a multivariate regression model in the context of a regulatory event study by computer intensive resampling, Working Paper, Institute of Professional Accounting, University of Chicago, July 1986.

A note on the algebraic and statistical properties of the multivariate market model, Working Paper, Institute of Professional Accounting, University of Chicago, September 1986.

On drawing inferences about market reactions to the regulation of accounting for oil and gas exploration: An application of computer intensive resampling methods, Working Paper, Institute of Professional Accounting, University of Chicago, September 1986.

On detecting abnormal returns to a portfolio of nonsynchronously traded securities, Working Paper, Institute of Professional Accounting, University of Chicago, October 1986.

Reduced demands on recovery room resources with Diprivan compared to thiopental-isoflurane, (with Michael W. Maher et al.), *Anesthesiology Review*, January/February 1989.

Wealth effects of going private for senior securities, (with Katherine Schipper and Abbie J. Smith), *Journal of Financial Economics*, 1989.

Consequences of going-private buyouts for public debt and preferred stock: 1974 to 1985, (with Katherine Schipper and Abbie J. Smith), in *Proceedings of the 25th Annual Conference on Bank Structure and Competition: Banking System Risk - Charting a New Course*, Federal Reserve Bank of Chicago, 1989.

Discussion of 'Post-earnings-announcement drift: Delayed price response or risk premium?', *Journal of Accounting Research*, 1989.

Using relative productivity assessments for allocating housestaff to departments, (with Michael W. Maher, Michael F. Roizen, et al.), *Medical Care*, 1990.

An adaptable computer model of the economic effects of alternative anesthetic regimens in outpatient surgery, (abstract; with Michael W. Maher et al.), *Anesthesiology (Supplement)*, September 1990.

On the finite sample performance of estimated generalized least squares in seemingly unrelated regressions: nonnormal disturbances and alternative standard error estimators, Working Paper, Institute of Professional Accounting, University of Chicago, January 1991.

Exploiting tax attributes of spinoffs to structure takeovers and takeover-related defenses, (with Katherine Schipper), Working Paper, Institute of Professional Accounting, University of Chicago, August 1991.

Technological innovation and firm decision-making: accounting, finance and strategy, (with Paul J. H. Schoemaker), Working Paper, Institute of Professional Accounting, University of Chicago, September 1991.

Process-oriented activity-based costing, (with Michael W. Maher), Working Paper, Institute of Professional Accounting, University of Chicago, June 1992.

A field study on the limitations of activity-based costing when resources are provided on a joint and indivisible basis (with Michael W. Maher), *Journal of Accounting Research*, 1998.

Correcting for omitted-variables and measurement-error bias in regression with an application to the effect of lead on IQ (with William E. Wecker), *Journal of the American Statistical Association*, June 1998.

Event study methods: detecting and measuring the security price effects of disclosures and interventions (with Katherine Schipper), in *Litigation Services Handbook: The Role of the Financial Expert*, *Cumulative Supplement*, 3rd ed., John Wiley & Sons, 2005.

Estimating Cost Behavior (with Michael W. Maher), in *Handbook of Cost Management*, 2nd ed., John Wiley & Sons, 2005.

Audit Committee Financial Literacy: A Work in Progress (with Douglas J. Coates and Roman L. Weil), *Journal of Accounting Auditing and Finance*, March 2007.

Statistical Estimation of Incremental Cost from Accounting Data (with William E. Wecker and Roman L. Weil), in *Litigation Services Handbook: The Role of the Financial Expert*, 6th Ed., John Wiley & Sons, 2017.

The Length of Civil Trials and Time to Judgment in Canada: A Case for Time Limited Trials (with Kevin LaRoche and David Salter), *Canadian Bar Review*, September 2021.

Attachment B:

Previous Testimony of M. Laurentius Marais

M. Laurentius Marais
Deposition and Trial Testimony
January 2017 – November 2021

1. Glaxosmithkline v. Teva Pharmaceuticals. United States District Court for the District of Delaware. Civil Action No. 14-878-LPS-CJB.
2. In Re Testosterone Replacement Therapy Products Liability Litigation. United States District Court for the Northern District of Illinois. MDL No. 2545. Master Docket Case No. 1:14-cv-01748.
3. Guarantee Trust Life Insurance v. Platinum Services, American Arbitration Association. Case No. 01-15-0005-9328.
4. Fairfield Sentry Limited v. PriceWaterhouseCoopers. Ontario Superior Court of Justice. Case No. CV-14-10550-00CL.
5. Graci v. Omega Flex. United States District Court for the District of Connecticut. Case No. 3:15-cv-00513.
6. The People of the State of California v. General Motors. California Superior Court of Orange County. Case No. 30-2014-00731038-CU-BT-CXC.
7. Wolf v Thomas. California Superior Court of Sonoma County. Case No. SCV-251845.
8. Mitchell v AbbVie. United States District Court for the Northern District of Illinois. Case No. 14 C 9178.
9. Couch v. AbbVie. Circuit Court of Cook County, Illinois. Case No. 2014 L 005859.
10. Super98 v. Delta Air Lines. United States District Court for the Northern District of Georgia, Atlanta Division. Case No. 1:16-cv-1535-LMM.
11. Risperdal and Invega Product Liability Cases. California Superior Court of Los Angeles County. Judicial Council Coordination Proceeding No. 4775.
12. Konrad v. AbbVie. United States District Court for the Northern District of Illinois, Eastern Division. Case No. 15 C 966.
13. Jordan v. Nationstar and Federal Housing Finance Agency, United States District Court for the Eastern District of Washington. Case No. 2:14-CV-00175-TOR.
14. Cotromano v. United Technologies and Adinolfe v. United Technologies. United States District Court for the Southern District of Florida. Case Nos. 13-CV-80928-RYSKAMP and 10-80840-CIV-KLR.
15. Nolte v AbbVie. United States District Court for the Northern District of Illinois, Eastern Division. Case No. 14 C 8135.
16. In Re General Motors LLC Ignition Switch Litigation. United States District Court for the Southern District of New York. Case No. 14-MD-2543.

17. Pinares v. United Technologies. United States District Court for the Southern District of Florida. Case No. 10-CIV-80883-Marra/Hopkins.
18. Reinard v. Crown Equipment. Iowa District Court for Black Hawk County. Case No. LACV130248.
19. Snyder v. California Insurance Guarantee Association. California Superior Court of Alameda County. Case No. RG-13-666656.
20. United States v. J-M Manufacturing. Case No. CV 6-55-GW (cf. No. 5:06-cv-00055-GW-PJW) (C.D. Cal.), Phase 2
21. Williams v. Crown Equipment. Superior Court of New Jersey, Camden County. Case No. L-511-16.
22. In Re National Prescription Opiate Litigation. United States District Court for the Northern District of Ohio, Eastern Division. MDL No. 2804.
23. State of Oklahoma v. Purdue Pharma. District Court of Cleveland County. Case No. CJ-2017-816.
24. George v. Omega Flex. United States District Court for the Western District of Missouri. Case no. 6:17-CV-03114-MDH.
25. Noven Pharmaceuticals v. Amneal Pharmaceuticals. United States District Court for the District of Delaware. Case No. 1:18-cv-699-LPS.
26. In Re Opiate Litigation. Supreme Court of the State of New York, County of Suffolk. Index No. 400000/2017.
27. KAIFI LLC v. AT&T. United States District Court for the Eastern District of Texas, Marshall Division. Case No. 2:19-CV-138.
28. Club Champion v. True Spec Golf. United States Patent and Trademark Office, Patent Trial and Appeal Board. Case No. IPR2019-01148.
29. Lundquist and Lara v. First National Insurance, LM General Insurance, and CCC Information Services. United States District Court for the Western District of Washington. Case No. 3:18-cv-05301-RJB.
30. Syngenta Crop Protection v. FMC. American Arbitration Board. Case No. 01-19-002-4208.
31. MV3 Partners LLC v. Roku, Inc. United States District Court for the Western District of Texas, Waco Division. Case No. 6:18-cv-00308.
32. Par Pharmaceuticals v. Amneal Pharmaceuticals. United States District Court for the District of Delaware. Case No. 18-cv-2032-CFC.
33. Arendi S.á.r.l. v. LG Electronics, Apple, Blackberry, Motorola, Sony, Google, and Oath. United States District Court for the District of Delaware. Case Nos. 12-1595-LPS–12-1597-LPS, 12-1601-LPS, 12-1602-LPS, 13-919-LPS, and 13-920-LPS.
34. People of the State of North Carolina v. JUUL Labs. General Court of Justice, Superior Court Division, Durham County. File No. 19CVS2885.

35. Jama v. State Farm Fire and Casualty, and Ngethpharat v. State Farm Fire and Casualty. United States District Court for the Western District of Washington at Seattle. Case Nos. 2:20-cv-00652-MJP and 3:20-cv-00454-MJP.
36. Olberg v. Allstate. United States District Court for the Western District of Washington. Case No. 18-cv-00573-JCC.
37. Treehouse v. Valve Corporation. United States District Court for the Western District of Washington. Case No. 2:17-cv-01860-RAJ.
38. State of New Hampshire v. Johnson and Johnson. New Hampshire Superior Court. Case No. 217-2018-CV-00678.
39. Fintiv v. Apple. United States District Court for the Western District of Texas, Austin Division. Case No.: 1:19-cv-01238.
40. State of California v. Purdue Pharma et al. California Superior Court, Orange County. Case No. 30-2014-00725287-CU-BT-CXC.
41. Vallee v. Crown Equipment. United States District Court for the Eastern District of Louisiana. Case No. 20-1571.
42. County of Dallas v. Purdue Pharma et al. District Court of Dallas County, Texas. MDL Pretrial Cause No. 2018-77098.
    In Re: Texas Opioid Litigation. District Court of Harris County, Texas. Master File No. 2018-63587.
43. KAIFI LLC v. T-Mobile US. United States District Court for the Eastern District of Texas, Marshall Division. Case No. 2:20-CV-00281-JRG.
44. In Re JUUL Labs, Inc., Marketing, Sales Practices, and Products Liability Litigation. United States District Court for the Northern District of California, San Francisco Division. Case No. 19-md-02913-WHO.
45. KAIFI LLC v. Verizon. United States District Court for the Eastern District of Texas, Marshall Division. Case No. 2:20-CV-00280-JRG.

Attachment C:

Materials Considered

Materials Considered

1. First Amended Complaint.
2. Amended Expert Report of [redacted] Ph.D., October 6, 2021.
3. Dirk F. Gerritsen, Rick A.C. Lugtigheid, and Thomas Walther, "Can Bitcoin Investors Profit from Predictions by Crypto Experts?," *Finance Research Letters*, 2021.
4. Mohammad Hashemi Joo, Yuka Nishikawa, and Krishnan Dandapani, "Announcement effects in the cryptocurrency market," *Applied Economics* Vol. 52, No. 44, 2020.
5. [redacted] electronic backup.

Attachment D:

[redacted] **Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days**

[redacted] Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days

"Unusual" Trading Days Identified by Dr. [redacted]s "Two-Sided Parametric Approach"

[redacted] Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			[redacted] "Select" Categories (i.e., All News Dates) (Max N=105)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	2,740	172	5	167	3	4	168	7	8	164	65	3	169	4	19	153	86
2	2,723	153	3	150	5	4	149	7	8	145	65	2	151	5	17	136	88
3	2,740	190	5	185	3	4	186	7	10	180	63	3	187	4	22	168	83
4	2,723	167	4	163	4	4	163	7	11	156	62	2	165	5	21	146	84
5	2,007	147	4	143	1	3	144	8	11	136	49	3	144	4	20	127	70
6	1,990	117	3	114	2	3	114	8	12	105	48	2	115	5	19	98	71
7	2,007	129	4	125	1	3	126	8	10	119	50	2	127	5	18	111	72
8	1,990	117	3	114	2	3	114	8	11	106	49	1	116	6	17	100	73
9	2,740	178	5	173	3	4	174	7	10	168	63	3	175	4	21	157	84
10	2,723	164	4	160	4	4	160	7	11	153	62	1	163	6	19	145	86
11	2,739	168	5	163	3	4	164	7	8	160	65	3	165	4	19	149	86
12	2,722	152	3	149	5	5	147	6	9	143	64	2	150	5	19	133	86
13	2,739	183	5	178	3	4	179	7	10	173	63	3	180	4	21	162	84
14	2,722	171	4	167	4	5	166	6	11	160	62	3	168	4	23	148	82
15	2,006	142	4	138	1	3	139	8	11	131	49	3	139	4	20	122	70
16	1,989	116	2	114	3	4	112	7	12	104	48	2	114	5	20	96	70
17	2,006	125	4	121	1	4	121	7	10	115	50	2	123	5	19	106	71
18	1,989	121	3	118	2	5	116	6	11	110	49	1	120	6	19	102	71
19	2,739	175	5	170	3	4	171	7	10	165	63	3	172	4	21	154	84
20	2,722	169	4	165	4	5	164	6	11	158	62	3	166	4	23	146	82

Source: [redacted] backup.

Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 33.7, 5th percentile is 6.0, 95th percentile is 75.3.

[redacted] Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days

"Unusual" Trading Days Identified by Dr. [redacted]s "One-Sided Non-Parametric Approach"

[redacted] Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			[redacted] "Select" Categories (i.e., All News Dates) (Max N=105)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	2,740	280	6	274	2	5	275	6	14	266	59	3	277	4	28	252	77
2	2,723	269	5	264	3	4	265	7	15	254	58	2	267	5	27	242	78
3	2,740	296	5	291	3	5	291	6	17	279	56	3	293	4	31	265	74
4	2,723	269	4	265	4	4	265	7	14	255	59	2	267	5	26	243	79
5	2,007	222	4	218	1	5	217	6	13	209	47	3	219	4	25	197	65
6	1,990	199	3	196	2	4	195	7	14	185	46	2	197	5	23	176	67
7	2,007	219	4	215	1	5	214	6	14	205	46	3	216	4	26	193	64
8	1,990	211	3	208	2	4	207	7	13	198	47	2	209	5	22	189	68
9	2,740	311	6	305	2	5	306	6	18	293	55	3	308	4	31	280	74
10	2,723	299	5	294	3	4	295	7	17	282	56	2	297	5	27	272	78
11	2,739	293	6	287	2	5	288	6	15	278	58	3	290	4	29	264	76
12	2,722	280	4	276	4	5	275	6	17	263	56	3	277	4	30	250	75
13	2,739	294	5	289	3	5	289	6	14	280	59	3	291	4	28	266	77
14	2,722	290	4	286	4	5	285	6	15	275	58	3	287	4	29	261	76
15	2,006	226	4	222	1	5	221	6	14	212	46	3	223	4	26	200	64
16	1,989	223	3	220	2	5	218	6	15	208	45	2	221	5	25	198	65
17	2,006	218	4	214	1	4	214	7	14	204	46	3	215	4	25	193	65
18	1,989	233	3	230	2	5	228	6	14	219	46	2	231	5	24	209	66
19	2,739	300	6	294	2	5	295	6	15	285	58	3	297	4	28	272	77
20	2,722	313	5	308	3	5	308	6	16	297	57	3	310	4	30	283	75

Source: [redacted] backup.

Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 51 3, 5th percentile is 7.9, 95th percentile is 107.5.

[redacted] Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days

"Unusual" Trading Days Identified by Dr. [redacted]s "Two-Sided Non-Parametric Approach"

[redacted] Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			[redacted] "Select" Categories (i.e., All News Dates) (Max N=105)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	2,740	140	2	138	6	4	136	7	8	132	65	3	137	4	16	124	89
2	2,723	128	2	126	6	4	124	7	9	119	64	2	126	5	17	111	88
3	2,740	147	4	143	4	4	143	7	7	140	66	3	144	4	18	129	87
4	2,723	140	4	136	4	4	136	7	8	132	65	2	138	5	18	122	87
5	2,007	119	3	116	2	3	116	8	11	108	49	3	116	4	20	99	70
6	1,990	97	3	94	2	3	94	8	11	86	49	2	95	5	19	78	71
7	2,007	113	4	109	1	3	110	8	9	104	51	2	111	5	17	96	73
8	1,990	101	3	98	2	3	98	8	9	92	51	1	100	6	15	86	75
9	2,740	155	3	152	5	4	151	7	9	146	64	2	153	5	18	137	87
10	2,723	141	3	138	5	4	137	7	9	132	64	1	140	6	17	124	88
11	2,739	151	3	148	5	4	147	7	9	142	64	3	148	4	18	133	87
12	2,722	143	3	140	5	5	138	6	9	134	64	2	141	5	19	124	86
13	2,739	159	4	155	4	4	155	7	9	150	64	3	156	4	20	139	85
14	2,722	157	4	153	4	5	152	6	8	149	65	3	154	4	20	137	85
15	2,006	124	3	121	2	3	121	8	11	113	49	3	121	4	20	104	70
16	1,989	115	2	113	3	4	111	7	11	104	49	2	113	5	19	96	71
17	2,006	123	4	119	1	4	119	7	11	112	49	2	121	5	20	103	70
18	1,989	124	2	122	3	5	119	6	11	113	49	1	123	6	18	106	72
19	2,739	161	5	156	3	4	157	7	8	153	65	3	158	4	20	141	85
20	2,722	158	4	154	4	5	153	6	9	149	64	3	155	4	21	137	84

Source: [redacted] backup.

Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 31.3, 5th percentile is 5.4, 95th percentile is 69.8.

Attachment E:

[redacted] **Event Study: Cumulative Investment Returns on "Unusual" Trading Days with and without Coincident Ripple News**

[redacted] Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News

Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [redacted]s "Two-Sided Parametric Approach"

[redacted] Ripple News Event Category:			Key Milestones			Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			[redacted] "Select" Categories (i.e., All News Dates)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in [redacted] Analysis Period	"Unusual" Trading Days in [redacted] Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	$34.26	$231,276,027	$2.04	$95,725,130	$1.09	$2.18	$114,728,496	$0.57	$66.33	$1,955,161	$0.70	$3.80	$60,808,242	$1.06	$377.33	$222,976	$0.51
2	$26.06	$21,826,605	$1.42	$13,374,758	$1.56	$2.18	$10,025,229	$0.57	$66.33	$215,810	$0.70	$2.49	$5,721,065	$1.62	$341.98	$33,120	$0.57
3	$34.26	$113,589,327	$2.04	$48,123,449	$1.09	$2.18	$56,347,961	$0.57	$58.14	$1,251,965	$0.80	$3.80	$29,865,470	$1.06	$338.84	$142,539	$0.57
4	$26.06	$10,043,271	$1.52	$5,735,615	$1.47	$2.18	$4,612,998	$0.57	$85.93	$101,327	$0.54	$2.49	$2,632,485	$1.62	$372.69	$15,503	$0.52
5	$92.55	$1,446,767	$1.99	$727,295	$1.03	$1.82	$779,957	$0.68	$51.07	$18,178	$0.71	$3.80	$380,391	$1.06	$236.51	$2,736	$0.59
6	$70.39	$121,741	$1.48	$82,496	$1.39	$1.82	$60,768	$0.68	$75.49	$1,403	$0.48	$2.49	$31,910	$1.62	$260.15	$284	$0.54
7	$92.55	$74,892	$1.99	$37,648	$1.03	$1.82	$40,374	$0.68	$40.79	$1,580	$0.89	$3.31	$22,603	$1.22	$164.55	$272	$0.85
8	$70.39	$38,581	$1.48	$26,144	$1.39	$1.82	$19,258	$0.68	$60.29	$551	$0.60	$2.17	$11,608	$1.86	$180.99	$128	$0.77
9	$34.26	$55,701,613	$2.04	$23,598,641	$1.09	$2.18	$27,631,754	$0.57	$58.57	$688,272	$0.80	$3.80	$14,645,345	$1.06	$333.20	$80,102	$0.58
10	$26.06	$6,961,014	$1.52	$3,975,368	$1.47	$2.18	$3,197,280	$0.57	$86.57	$74,335	$0.54	$2.17	$2,094,416	$1.86	$319.28	$13,386	$0.61
11	$34.91	$151,871,877	$2.04	$64,342,300	$1.09	$2.18	$75,338,686	$0.57	$51.85	$1,886,229	$0.90	$3.80	$39,930,908	$1.06	$294.97	$220,188	$0.66
12	$26.55	$6,253,727	$1.42	$3,922,496	$1.56	$2.45	$2,550,078	$0.51	$76.64	$60,248	$0.61	$2.49	$1,639,191	$1.62	$445.10	$8,976	$0.43
13	$34.91	$150,491,381	$2.04	$63,757,437	$1.09	$2.18	$74,653,867	$0.57	$58.14	$1,658,694	$0.80	$3.80	$39,567,942	$1.06	$330.74	$193,469	$0.59
14	$26.55	$3,242,315	$1.52	$1,851,655	$1.47	$2.45	$1,322,117	$0.51	$85.93	$32,787	$0.54	$3.80	$852,486	$1.06	$418.51	$4,963	$0.46
15	$87.93	$1,652,658	$1.99	$830,797	$1.03	$1.82	$890,954	$0.68	$51.07	$20,765	$0.71	$3.80	$434,525	$1.06	$236.51	$3,126	$0.59
16	$66.87	$33,127	$1.39	$23,909	$1.48	$2.05	$14,680	$0.61	$75.49	$382	$0.48	$2.49	$8,683	$1.62	$281.86	$71	$0.50
17	$87.93	$86,244	$1.99	$43,355	$1.03	$2.18	$42,783	$0.57	$40.79	$1,819	$0.89	$3.31	$26,029	$1.22	$196.69	$288	$0.71
18	$66.87	$75,062	$1.48	$50,865	$1.39	$2.45	$30,608	$0.51	$60.29	$1,071	$0.60	$2.17	$22,585	$1.86	$243.68	$203	$0.57
19	$34.91	$53,196,612	$2.04	$22,537,368	$1.09	$2.18	$26,389,105	$0.57	$58.57	$658,821	$0.80	$3.80	$13,986,718	$1.06	$333.20	$76,674	$0.58
20	$26.55	$2,761,401	$1.52	$1,577,010	$1.47	$2.45	$1,126,015	$0.51	$86.57	$29,556	$0.54	$3.80	$726,041	$1.06	$421.62	$4,030	$0.46

Source [redacted] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 21,665, 5th percentile is 1.6, 95th percentile is 31,327,597.

[redacted] Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News

Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [redacted]s "One-Sided Non-Parametric Approach"

[redacted] Ripple News Event Category:			Key Milestones			Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			[redacted] "Select" Categories (i.e., All News Dates)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in [redacted] Analysis Period	"Unusual" Trading Days in [redacted] Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	$34.26	$20,933,031,362	$2.05	$8,624,570,477	$1.08	$2.45	$9,218,904,573	$0.51	$130.92	$101,508,024	$0.36	$3.80	$5,503,816,588	$1.06	$1,114.87	$9,146,731	$0.17
2	$26.06	$13,237,688,744	$1.52	$7,351,959,810	$1.46	$2.18	$6,449,448,808	$0.57	$153.77	$61,619,473	$0.30	$2.49	$3,416,406,232	$1.62	$768.10	$8,489,520	$0.25
3	$34.26	$9,356,265,880	$2.04	$3,963,891,662	$1.09	$2.45	$4,120,498,404	$0.51	$174.15	$49,856,523	$0.27	$3.80	$2,422,149,810	$1.06	$1,154.89	$4,798,762	$0.17
4	$26.06	$1,811,720,236	$1.52	$1,034,655,961	$1.47	$2.18	$762,311,532	$0.57	$170.48	$7,932,288	$0.27	$2.49	$467,571,978	$1.62	$1,007.19	$970,098	$0.19
5	$92.55	$14,503,462	$1.99	$7,290,940	$1.03	$2.45	$6,387,323	$0.51	$75.92	$127,472	$0.48	$3.80	$3,813,322	$1.06	$484.89	$15,242	$0.29
6	$70.39	$4,502,262	$1.48	$3,050,902	$1.39	$2.18	$1,894,402	$0.57	$112.21	$35,571	$0.32	$2.49	$1,180,107	$1.62	$473.49	$5,898	$0.30
7	$92.55	$1,689,587	$1.99	$849,361	$1.03	$2.45	$828,310	$0.51	$91.47	$15,234	$0.40	$3.80	$444,235	$1.06	$560.54	$1,940	$0.25
8	$70.39	$1,674,237	$1.48	$1,134,526	$1.39	$2.18	$768,998	$0.57	$66.53	$15,305	$0.55	$2.49	$438,841	$1.62	$269.33	$2,650	$0.52
9	$34.26	$681,098,380	$2.05	$287,236,133	$1.08	$2.45	$299,955,647	$0.51	$112.49	$4,244,122	$0.42	$3.80	$179,077,769	$1.06	$710.34	$428,029	$0.27
10	$26.06	$131,974,421	$1.52	$75,024,757	$1.46	$2.18	$60,617,479	$0.57	$121.67	$895,210	$0.38	$2.49	$35,274,424	$1.62	$507.59	$139,357	$0.38
11	$34.91	$32,205,701,307	$2.05	$13,268,997,495	$1.08	$2.45	$14,183,387,104	$0.51	$136.47	$171,660,459	$0.34	$3.80	$8,467,682,966	$1.06	$1,162.19	$15,468,059	$0.17
12	$26.55	$4,713,522,744	$1.43	$2,875,115,850	$1.55	$2.45	$2,225,508,774	$0.51	$149.11	$23,735,584	$0.31	$3.80	$1,220,236,617	$1.06	$785.25	$3,491,389	$0.25
13	$34.91	$7,156,148,334	$2.04	$3,031,786,086	$1.09	$2.45	$3,151,566,892	$0.51	$155.34	$32,234,831	$0.30	$3.80	$1,852,583,451	$1.06	$1,070.88	$3,102,649	$0.18
14	$26.55	$2,354,905,754	$1.52	$1,344,863,974	$1.47	$2.45	$1,111,878,249	$0.51	$144.84	$10,693,117	$0.32	$3.80	$609,637,926	$1.06	$960.86	$1,464,710	$0.20
15	$87.93	$8,791,088	$1.99	$4,419,310	$1.03	$2.45	$3,871,594	$0.51	$67.52	$106,566	$0.54	$3.80	$2,311,396	$1.06	$431.28	$12,753	$0.32
16	$66.87	$3,768,698	$1.48	$2,553,811	$1.39	$2.45	$1,536,760	$0.51	$108.97	$29,518	$0.33	$2.49	$1,007,306	$1.62	$517.92	$4,840	$0.27
17	$87.93	$625,642	$1.99	$314,512	$1.03	$2.18	$345,487	$0.57	$91.47	$6,442	$0.40	$3.80	$164,497	$1.06	$497.64	$1,013	$0.28
18	$66.87	$335,538	$1.48	$227,373	$1.39	$2.45	$136,822	$0.51	$67.15	$3,222	$0.54	$2.49	$87,564	$1.62	$306.22	$506	$0.46
19	$34.91	$872,299,114	$2.05	$367,870,240	$1.08	$2.45	$384,160,428	$0.51	$67.84	$6,949,769	$0.69	$3.80	$229,349,216	$1.06	$445.34	$700,899	$0.43
20	$26.55	$145,263,737	$1.52	$82,579,461	$1.46	$2.45	$68,586,859	$0.51	$96.63	$744,179	$0.48	$3.80	$38,193,463	$1.06	$623.75	$104,852	$0.31

Source: [redacted] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 450,663, 5th percentile is 11.1, 95th percentile is 3,360,749,256.

[redacted] Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News

Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [redacted]s "Two-Sided Non-Parametric Approach"

[redacted] Ripple News Event Category:			Key Milestones			Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			[redacted] "Select" Categories (i.e., All News Dates)		
			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …			"Unusual" Trading Days …		
[redacted] Model No.	All Trading Days in [redacted] Analysis Period	"Unusual" Trading Days in [redacted] Analysis Period	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
1	$34.26	$7,330,417	$1.39	$4,965,900	$1.60	$2.18	$3,366,951	$0.57	$61.70	$90,135	$0.76	$3.80	$1,927,350	$1.06	$237.87	$22,813	$0.81
2	$26.06	$2,674,410	$1.39	$1,569,306	$1.60	$2.18	$1,228,390	$0.57	$91.20	$18,810	$0.51	$2.49	$701,001	$1.62	$457.50	$3,748	$0.42
3	$34.26	$9,829,221	$1.52	$4,451,387	$1.47	$2.18	$4,514,682	$0.57	$55.81	$126,874	$0.84	$3.80	$2,584,348	$1.06	$241.30	$20,954	$0.80
4	$26.06	$2,473,758	$1.52	$1,412,739	$1.47	$2.18	$1,136,228	$0.57	$82.49	$21,603	$0.57	$2.49	$648,407	$1.62	$357.77	$4,485	$0.54
5	$92.55	$384,424	$1.48	$178,933	$1.39	$1.82	$191,889	$0.68	$67.37	$4,966	$0.54	$3.80	$101,075	$1.06	$237.09	$916	$0.59
6	$70.39	$26,470	$1.48	$17,937	$1.39	$1.82	$13,213	$0.68	$72.42	$235	$0.50	$2.49	$6,938	$1.62	$255.66	$63	$0.55
7	$92.55	$91,232	$1.99	$45,863	$1.03	$1.82	$49,184	$0.68	$39.13	$1,463	$0.93	$3.31	$27,535	$1.22	$157.85	$348	$0.89
8	$70.39	$15,736	$1.48	$10,663	$1.39	$1.82	$7,855	$0.68	$39.13	$342	$0.93	$2.17	$4,735	$1.86	$117.46	$109	$1.19
9	$34.26	$9,803,158	$1.48	$4,153,347	$1.51	$2.18	$4,502,711	$0.57	$56.19	$123,505	$0.83	$3.31	$2,958,676	$1.22	$205.90	$21,904	$0.94
10	$26.06	$379,435	$1.48	$202,721	$1.51	$2.18	$174,279	$0.57	$56.19	$6,243	$0.83	$2.17	$114,164	$1.86	$206.54	$1,392	$0.94
11	$34.91	$14,480,925	$1.42	$10,485,992	$1.56	$2.18	$6,651,268	$0.57	$71.29	$177,384	$0.66	$3.80	$3,807,397	$1.06	$282.49	$47,989	$0.68
12	$26.55	$7,667,894	$1.42	$4,809,497	$1.56	$2.45	$3,126,732	$0.51	$76.64	$54,474	$0.61	$2.49	$2,009,865	$1.62	$445.10	$8,116	$0.43
13	$34.91	$28,826,553	$1.52	$11,307,833	$1.47	$2.18	$13,240,392	$0.57	$71.48	$350,449	$0.65	$3.80	$7,579,221	$1.06	$309.04	$50,092	$0.63
14	$26.55	$7,319,716	$1.52	$4,180,219	$1.47	$2.45	$2,984,756	$0.51	$69.33	$64,417	$0.67	$3.80	$1,924,536	$1.06	$337.62	$9,752	$0.57
15	$87.93	$475,372	$1.48	$221,265	$1.39	$1.82	$237,286	$0.68	$67.37	$6,141	$0.54	$3.80	$124,987	$1.06	$237.09	$835	$0.59
16	$66.87	$83,411	$1.39	$60,201	$1.48	$2.05	$36,963	$0.61	$72.42	$739	$0.50	$2.49	$21,863	$1.62	$270.38	$138	$0.52
17	$87.93	$186,039	$1.99	$93,523	$1.03	$2.18	$92,288	$0.57	$56.08	$2,823	$0.65	$3.31	$56,148	$1.22	$270.44	$615	$0.52
18	$66.87	$175,979	$1.39	$130,972	$1.48	$2.45	$71,759	$0.51	$60.29	$1,944	$0.60	$2.17	$52,948	$1.86	$228.79	$389	$0.61
19	$34.91	$29,399,637	$2.04	$12,455,501	$1.09	$2.18	$14,584,202	$0.57	$51.98	$355,096	$0.90	$3.80	$7,729,899	$1.06	$302.92	$54,863	$0.64
20	$26.55	$1,103,209	$1.52	$630,032	$1.47	$2.45	$449,855	$0.51	$76.82	$10,844	$0.61	$3.80	$290,061	$1.06	$374.14	$1,642	$0.52

Source [redacted] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 20,536, 5th percentile is 2.2, 95th percentile is 4,832,779.